

## TRANSFORMATIONS FOR DENOISING IMAGES

### ABSTRACT

Systems and methods of denoising images are described. In one aspect, spatially-shifted forward transforms of the input image are computed. Each  
5 forward transform is computed based on a denoiser transform  $Z$  having an associated transpose  $Z'$ , wherein a matrix multiplication between  $Z$  and  $Z'$  produces a diagonal matrix  $\Lambda$ ,  $Z = F(D)$ ,  $F$  specifies a mapping from coefficients of  $D$  to coefficients of  $Z$ , and  $D$  substantially corresponds to a frequency-domain transform. The forward transforms are denoised based on nonlinear mappings  
10 derived from quantization values linked to the input image. Spatially-shifted inverse transforms of the denoised forward transforms are computed. Each inverse transform is computed based on  $Z$  and  $Z'$ . An output image is computed based on a combination of spatially-shifted inverse transforms.